

## OCEAN GALES AND STORMS, MARCH 1935—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began March	Time of lowest barom-eter March	Gale ended March	Low-est ba-rom-eter	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and high-est force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH PACIFIC OCEAN—Continued													
Niagara, Br. S. S.	Honolulu	Victoria, B. C.	43 09 N.	134 19 W.	18	3p, 20	20	Inches 30.03	E	NNW, 7	NNW	NW, 10	
Tyndareus, Br. S. S.	Yokohama	do	41 18 N.	152 14 E.	22	2a, 23	23	29.33	N	NNW, 10	NNW	NNW, 10	NNE-NW.
Jefferson Myers, Am. S. S.	do	Los Angeles	41 42 N.	159 56 E.	22	8a, 23	23	29.30	E	SSE, 8	W	SW, 10	SSE-SW.
Comeric, Br. S. S.	Milke	New West- minster.	49 16 N.	167 22 E.	23	8p, 23	24	29.42	SE	SSW, 9	WSW	SW, 9	SE-S-SW.
Oregon, Am. S. S.	Dairen	San Francisco	43 06 N.	135 48 W.	23	3a, 24		29.80	WSW	WSW, 8		WSW, 9	WSW-W.
Nitro, U. S. N. Aux.	Pearl Harbor	Bremerton	48 14 N.	125 40 W.	24	11p, 24	24	29.30	WNW	SW, 6	W	WNW, 9	
San Diego Maru, Jap. M. S.	Kobe	San Francisco	35 07 N.	148 00 E.	25	4p, 25	25	28.92	SE	SW, 8	WSW	ESE, 9	ESE-SW-WSW.
Nichiyo Maru, Jap. M. S.	Yokohama	do	38 40 N.	147 20 E.	25	9a, 26	27	28.85	SE	SSW, 9	WSW	ESE, 9	SSW-SW.
Pres. Jefferson, Am. S. S.	Victoria, B. C.	Yokohama	45 54 N.	159 02 E.	26	Mdt, 27	27	29.04	ESE	E, 3	E	E, 9	E-NNE.
Steel Traveler, Am. S. S.	Los Angeles	Honolulu	27 28 N.	143 10 W.	28	4a, 28	28	29.85	WSW	SSE, 7	WSW	WSW, 9	SSE-WSW.
Meigs, U. S. A. Trans.	Manila	San Francisco	37 06 N.	138 00 W.	29	3a, 30	30	29.79	ESE	ESE, 8	ESE	ESE, 8	None.
SOUTH PACIFIC OCEAN													
Eclipse, Br. S. S.	Dunedin, N. Z.	Los Angeles	27 30 S.	160 15 W.	21	Mdt, 21	22	29.53	ESE	E, 8	SSE	ESE, 9	E-SSE.
Maunganui, Br. S. S.	Wellington	Rarotonga	26 57 S.	165 36 W.	22	8a, 22	22	28.90	ESE	SSE, 12	SSW	SSE, 12	ESE-SSE.

\* Position approximate.

\* Barometer uncorrected.

## NORTH PACIFIC OCEAN, MARCH 1935

By WILLIS E. HURD

**Atmospheric pressure.**—The average atmospheric pressure over the North Pacific Ocean for March 1935 shows the center of the Aleutian Low to have been over the Bering Sea, at a somewhat higher latitude than usual for the month. The pressure at the approximate center (29.74 at St. Paul Island) was close to normal. Along the Alaskan Peninsula and the Aleutians pressure was approximately 0.20 inch above the normal. This was due to two facts, viz, the unusual northward movement of many of the high-latitude centers of cyclonic action, and the passage of extensive high-pressure areas along the neighborhood of the forty-fifth to fifty-fifth parallels. The lowest recorded pressure of the month was 28.38 inches, observed at St. Paul on the 14th, and on the 7th near 51° N., 173° W., as reported by the Japanese M. S. *Hikawa Maru*. In the Aleutians the highest pressure was 30.68 inches at Dutch Harbor on the 18th.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, March 1935, at selected stations

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Point Barrow	30.25	+0.10	30.94	26	29.72	10, 17
Dutch Harbor	29.88	+ .18	30.68	18	28.78	8
St. Paul	29.74	+ .01	30.50	18	28.38	14
Kodiak	29.92	+ .23	30.46	19	29.08	9
Juneau	29.89	-.05	30.47	29	28.96	23
Tatoosh Island	29.92	-.04	30.37	15	29.20	24
San Francisco	30.06	.00	30.39	11	29.67	6
Mazatlan	29.92	.00	30.00	14	29.84	26, 27
Honolulu	29.98	-.06	30.14	13	29.79	18
Midway Island	30.07	.00	30.26	17	29.82	9
Guam	29.85	-.05	29.94	14, 16	29.76	4
Manila	29.87	+ .01	29.94	6, 9	29.80	2, 3
Hong Kong	29.94		30.08	6	29.70	27
Naha	30.01	+ .01	30.16	5, 6	29.68	27
Chichishima	30.00	.00	30.24	15	29.84	2, 3, 28, 31
Nemuro	29.85		30.40	23	29.18	25

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

A secondary low in the average pressure situation over the northeastern part of the Pacific reflected the frequent

cyclonic action of the month to southeastward of the Alaskan Peninsula.

In middle latitudes pressure was practically normal and moderately high along the entire width of the ocean.

In lower latitudes pressure was normal or nearly so at the extreme eastern and western stations, as typified by Manila and Mazatlan, but was below normal at Guam and Honolulu.

**Cyclones and gales.**—March 1935 cannot be characterized as an intensely stormy month on the North Pacific, yet gales were frequent along the western part of the northern steamship routes, particularly between the central Aleutians and the Japanese islands of Honshu and Hokushu. In some localities east of the Kurile Islands winds of force 8 to 10 occurred about 1 day in 4. Gales of force 11 have been reported on 4 dates only—the 11th, 12th, 18th, and 28th.

Over northern mid-ocean, gales were less intense and much less frequent than to the westward, and from higher latitudes between 150° and 160° W. no winds of gale force have been reported. East of 150° W. there were two regions of some storminess: One north of the fortieth parallel, between 140° W. and the American coast; the other about midway between the easternmost Hawaiian Islands and the California coast.

The Tropics were generally quiet, except for a few isolated gales.

Three extra-tropical cyclones of some importance originated in the Far East. The first crossed northern Japan on the 4th and entered the Bering Sea by way of the central Aleutians on the 8th. This storm spread greatly in area after passing to sea and was productive of fresh to strong gales over a considerable extent of ocean. On the 7th, 8th, and 9th, while the cyclone was central over extreme northern waters, the gale field gave scattered high wind velocities from the Aleutians southward and southwestward as far as the thirty-fifth to thirtieth parallels. The lowest pressure of the month reported on shipboard, 28.38 inches, occurred in connection with this storm late on the 7th, just south of Atka Island, in the central Aleutians.

The second cyclone of note appeared central over Hokushu and the southern Kuriles on the 9th and 10th. Gales of force 10 occurred in connection with it as far

south as southeastern Honshu on the 10th. On the 11th and 12th the storm increased in energy as it proceeded northeastward, the wind rising to force 11 on the earlier date near 42° N., 155° E., and on the 12th near 48° N., 164° E. On the 13th and 14th the disturbance was central over the Bering Sea, but accompanying winds of fresh to whole gale force were experienced by a number of ships between 40° and 50° N., 160° E. and 160° W.

The third cyclone formed as a depression south of Japan about the 24th. Its center moved north along the Japanese east coast until the 27th, when it lay east of the Kuril Islands. Thence it proceeded into the Bering Sea. Gales of force 8-9 accompanied it during most of its passage of the usual ship-traveled zone during the 25th-26th. On the 27th, however, the Japanese S. S. *Hiye Maru* experienced gales of force 10 near 45° N., 155° E., with barometer depressed to 28.67 inches. On the early morning of the 28th, while the storm center was far to the northeastward, this ship experienced a west gale of force 11 near 42° N., 149° E.

On the 18th the British S. S. *Empress of Asia* encountered a gale of force 11, barometer 28.60, near 46° N., 159° E. It is evident that a deep cyclone was then in existence in this stormy northwestern sector of the ocean, but little is known of its history, except that on the 18th winds of force 10, in addition to the force 11 mentioned, occurred over a considerable region east of the Kuril Islands.

On the 11th, 12th, and 24th ships encountered fresh to strong gales off the Washington and Oregon coasts, and to seaward practically as far as 140° W. The highest wind velocity at the exposed land station, Tatoosh Island, was 56 miles from the southwest on the 24th. The 2d, 3d, and 20th were also stormy days locally between approximately 40° and 50° N., 130° and 145° W., with gales of force 10 occurring on the 2d and 20th.

Northeast of the Hawaiian Islands several depressions affected the weather situation. The first was of brief existence, but resulted in a gale of force 9 near 25° N., 154° W. The most important low was that which appeared central near 27°-28° N., 142°-143° W., on the 14th and 15th, thence moved slowly northwestward, diminishing in intensity until its disappearance on the 22d north of Midway Island. During the 14th and 15th—the only days on which gales were reported in connection with the disturbance—the field of high winds lay roughly between 25° and 35° N., 135° and 150° W. The maximum wind force was 10, near 26° N., 146° W., on the 14th.

On March 4 the British S. S. *Makura* reported an east gale of force 9 in 8° 35' N., 138° 08' W. Owing to the fact that the ship's corrected barometer fell to 29.66 on that date, there is room for a reasonable suspicion that a depression had formed in the vicinity.

*Tehuantepecers*.—Northerly occurred in the Gulf of Tehuantepec as follows: Of force 7 on the 2d; of force 8 on the 14th.

*Fog*.—The distribution of fog differed considerably in March from that of the preceding February, there being a much less occurrence along the American coast, except in the Tropics, and much more trans-Pacific fog. For the coast, it was reported on 2 days north of the 30th parallel; on 1 day off Lower California; on 5 days in the Gulf of Tehuantepec; and on 1 day near the Costa Rica coast. Along the eastern two-thirds of the northern and central routes 1 to 4 days of fog were observed in most of the 5° squares north of 35° N.

#### SEA-SURFACE TEMPERATURE SUMMARY FOR THE WESTERN CARIBBEAN SEA

By GILES SLOCUM

The area embraced in this summary is the 5° square from 80° W. to 85° W. and 15° N. to 20° N. The table shows monthly mean sea-surface temperatures, computed to tenths of a degree for the period 1920 to 1933, inclusive.

*Monthly and annual sea-surface temperatures in the western Caribbean Sea, 1920 to 1933, inclusive*

Year	Total number of observations for the year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
1920	205	77.7	78.0	78.8	79.4	80.5	81.1	81.3	82.0	82.2	81.8	82.2	80.2	80.4
1921	328	78.5	79.4	78.4	79.8	80.7	80.9	81.8	81.7	81.9	81.8	80.7	80.4	80.5
1922	246	79.5	78.6	79.3	79.2	79.8	81.2	81.6	81.8	83.0	82.2	81.6	79.2	80.6
1923	366	78.4	78.0	78.5	79.5	81.1	80.9	81.7	82.4	82.7	81.4	80.8	79.5	80.4
1924	331	78.7	77.7	78.4	79.7	81.3	81.8	81.5	82.8	84.2	82.0	81.0	79.8	80.7
1925	512	78.9	78.9	78.6	80.6	81.4	81.4	81.4	82.3	82.5	82.7	82.1	80.9	81.0
1926	602	79.6	78.9	79.5	81.1	82.2	82.3	83.3	83.1	82.1	82.8	81.6	80.9	81.4
1927	624	79.0	79.3	79.6	80.2	81.3	82.4	82.3	83.1	84.2	83.6	81.7	80.5	81.4
1928	608	78.8	78.5	78.6	79.5	80.8	81.5	81.3	82.9	82.8	82.6	81.9	79.4	80.7
1929	714	79.4	78.8	79.7	80.0	80.2	81.5	82.0	82.3	82.5	82.4	81.9	80.0	80.9
1930	616	78.6	78.9	79.5	79.9	82.2	82.1	82.3	83.0	83.4	83.7	81.9	80.5	81.3
1931	679	80.5	79.2	79.8	80.6	83.2	83.9	83.6	83.7	83.9	83.2	81.8	80.7	82.0
1932	665	80.1	79.6	80.1	80.5	80.8	82.5	82.8	83.6	84.4	84.1	81.1	79.6	81.6
1933	690	79.3	79.5	79.9	80.4	81.4	82.8	83.0	83.6	83.4	82.5	81.3	79.4	81.4
Number of years' record		14	14	14	14	14	14	14	14	14	14	14	14	14
Mean (1912-33)		79.1	78.8	79.2	80.0	81.2	81.9	82.1	82.7	83.1	82.8	81.5	80.1	81.0

#### DUST STORMS

[Compiled by W. A. MATTICK]

Dust storms, or wide-spread dusty conditions, were first brought to the attention of many people during November 1933 when dust was transported from our Midwestern States to eastern sections. During the spring of 1934 other wide-spread distributions of dust occurred, culminating with one of marked intensity in May. These storms have been rather fully reported in the February 1935 MONTHLY WEATHER REVIEW.

The period June 1, 1934, to February 28, 1935, was one of continued dusty conditions over the Plains States. There were not, however, such favorable combinations of air movement as to carry the dust over great distances. The storms were confined largely to the section of origin—the western Plains. Figure 1 shows for this period the

number of days with dusty conditions, as reported by first-order stations of the Weather Bureau. There are two regions of intense dustiness, centered in eastern South Dakota and in northwestern Texas. The latter locality has continued to be unfavorably dry, but the former had beneficial precipitation during early April this year. During the period under consideration there were only two instances of dust being transported over large distances from the place of origin. The first was around June 1, 1934, and the second about February 22, 1935. In neither of these cases, however, was the dust widely distributed; it was confined to the upper Mississippi Valley, except for scattered, localized occurrences elsewhere.